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ABSTRACT

This practicum was designed to provide better access to current information for the students and staff in a middle school. The printed materials in the school's media center were outdated, in scarce supply, or had inadequate subject coverage. Electronic databases were available for online searching and information retrieval, but students did not know how to use them as a source for completing class assignments or how to browse within the online services to find additional information. Lesson plans and strategies were developed to train students and teachers on two online services available in the media center. Daily sessions on the databases provided students and teachers with training in e-mail usage, searching and locating information on current events, printing from the screen, saving messages, and dialing into the online services. Teachers were encouraged to continue to use the services for curriculum enrichment and as an additional source for future lesson plans. Students were much less hesitant than teachers to use the online databases. The most successful activities involved students improving their communication skills by becoming "key pals" with other schools. Teachers enthusiastically supported these activities and requested that key pal projects become a permanent part of the curriculum for service learning and responsible student citizenship. (Contains 90 references and 9 appendices of materials used in the project.) (Author/SWC)

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ED 400 781

Using an Internet Service to Bring Its Resources and Educational Possibilities to Middle School Students, Staff, and Community Residents

by

Annette Christy

Cluster 59

A Practicum II Report Presented to the
Ed.D. Program in Child and Youth Studies
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

NOVA SOUTHEASTERN UNIVERSITY

1995

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PRACTICUM APPROVAL SHEET

This practicum took place as described.

Verifier:

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Principal
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August 31, 1995

August 31, 1995
Date

This practicum report was submitted by Annette Christy under the direction of the advisor listed below. It was submitted to the Ed.D. Program in Child and Youth Studies and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova Southeastern University.

Approved:

10/25/95
Date of Final Approval of Report

Mary Ellen Sapp, Ph.D.,
Advisor

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ABSTRACT

Using an Internet Service to Bring Its Resources and Educational Possibilities to Middle School Students, Staff, and Community Residents. Christy, Annette., 1995: Practicum Report, Nova Southeastern University, Ed.D.Program in Child and Youth Studies. Media Center/Online Services/Internet Usage/Information Retrieval Teaching/Computer Literacy/Information Retrieval Skills/Service Learning

This practicum was designed to provide better access to current information for the students and staff in a middle school. The printed materials located in this middle school's media center did not have this information due to their age, scarcity, or inadequate subject coverage. Electronic databases were available in the media center for online searching and information retrieval. However, the students of this middle school did not know how to use these databases as a source for completing class assignments or how to browse within these online services to find additional information. Teachers also learned how to use this electronic information to enrich their lesson plans and enhance their curriculum offerings.

The writer developed lesson plans and strategies to train students and teachers on two online services available in her media center. Daily sessions on these databases provided students and teachers with training in E-mail usage, searching and locating current events information, printing from off the screen, how to save messages, and how to dial into the online services. Teachers were encouraged to continue to use these services for curriculum enrichment and as an additional source for future lesson plans.

An analysis of the data revealed that students are much less hesitant to use these online databases than teachers. The most successful activities were those that involved students improving their communication skills by becoming key pals with other schools. Teachers enthusiastically supported these activities and requested that key pal projects become a permanent part of the curriculum for service learning and responsible student citizenship.

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CHAPTER I

INTRODUCTION

The setting of this practicum is a middle school that consists of Grades 5 through 8. This middle school is in the northern part of the school district. It is an area that is rapidly expanding with new, expensive, housing developments. This middle school is one of three within the district and has the largest enrollment of those three because of the area's rapid growth.

According to a recent study, *South Carolina Education Profiles* (1993), the school district has a student enrollment of 6,420. The racial make up of that student enrollment is 94% Caucasian, 6 % Afro-American, and 0.2% of other racial extractions. A small number of the total student population, 11%, is classified as disabled.

The median income for this county is $14,535, as compared with the overall state's income of $15,391. These income differences can probably be attributed to the fact that 51% of the population still live in the county's rural areas. Families with incomes below the poverty level number 16% in this county. The children from these families are eligible to receive free or reduced lunches at their schools. This school district serves free lunches to 17% of its students and offers a reduced in

cost lunch to 4% of the total student population.

The area surrounding this middle school is still considered to be rural. The nearest city is 8 miles from the school and is in a neighboring county. It has a population of 14,264, according to the 1990 census. The largest city in this region is a distant 20 miles and has a population of 59,800, as of the 1990 census. It is in yet another county. Traveling these distances to acquire information or to research any subject is a hardship for many county residents.

This situation may account for the educational attainment levels of this county. Illiteracy is considered to be a very real problem for the area. Only 32% of the residents have graduated from a high school. Those residents who have a college degree number 15%.

The major employers for the county residents are the manufacturing industries that employ 36%, the wholesale and retail trades employ 23%, government provides jobs to 16%, and the service industry employs 16% of the population. Construction, transportation, and the financial industries account for the rest of the employers for the county.

Description of the Community

This community is in the Piedmont region of a southeastern state. It is a farming community which is now experiencing a rapid transformation. Its pastures have been

sold to housing contractors who are building large expensive dwellings for new residents. These newcomers are not natives to this area or to the state.

These new residents who transfer here from larger metropolitan areas, bring with them higher educational expectations than the native residents of this area. The new residents are accustomed to schools that share in a much larger tax base and, therefore, can offer students greater educational services and resources. Frequently, these newcomers express shock and disappointment when they tour the community schools and see the existing conditions.

The schools that are experiencing the greatest increases in student growth are some of the oldest in the district. Since tax dollars have been limited for so many years, the buildings have been poorly maintained and have deteriorated beyond what is to be expected for their age. The equipment within these building is also dated. Students have very limited opportunities to use computers, and these computers are mostly of the Apple IIe variety.

The new residents are starting to demand that school board members allocate more tax dollars to improving this situation. However, most of the board members are land owners, and resist and oppose any increases in their property taxes. Recently a tax referendum was defeated for this very reason. However, because of the pressure being placed on the school district's administrators to provide a better education that incorporates technology into the curriculum, the situation may change for the better.

Although only 15% of the community's students ever obtain a college degree, 37% of the high school graduates will enter the job force immediately after their graduation (Nielsen, 1993). The employers of these graduates will expect that their new employees have had some kind of training in how to use computers and in other work applications which involve computers.

Writer's Work Setting and Role

The writer's school consists of Grades 5 through 8. It has an enrollment of approximately 860 students, and a faculty of 50. The students come from extremely diverse backgrounds. Many are from wealthy, educated families, while others live in poverty. Some of the students can be classified as "homeless," because they have no permanent home from one week to another. The more affluent students have intentions of seeking an advanced education after completing high school. However, there is another segment of the student population who wishes their formal education would end tomorrow.

It is the role of this writer, a media specialist, to serve all these populations to the best of her ability. The media center is strategically located in the building to offer its services to as many patrons as possible. It was built in 1987 and is a separate wing that connects the fifth and sixth grade building to the seventh and eighth grade building. This media center is equipped with several technologies which the district

high school, just across the road, does not even have.

This media center is fully automated with an electronic card catalog and circulation system. It has two multimedia electronic encyclopedias which are updated yearly. It broadcasts the Channel One News program daily and also can retrieve and store this program's Classroom Channel for the faculty. The center has two laser disk players used for the Windows in Science programs. Newsbank is another resource available to students and the faculty on microfiche. The center also has additional resources on CD-ROM format which can easily be retrieved. Although these technologies are available to everyone, these resources are definitely not used by the students and the faculty.

The media center staff consists of the writer and a full-time aide. As previously mentioned, it is the writer's role to provide access to all information retrieval systems for the students and staff. The writer has been director of this media center for the past 10 years.

Because most middle schools and even many high schools do not have the different kinds of technologies that are available in this writer's middle school, it was chosen in 1990 to be a tour site for the South Carolina Association of School Librarians (SCASL). More than 50 librarians and administrators toured the center and saw students using the various programs that were available to them on a daily basis.

The SCASL has also recognized this writer as a member of the Leadership

Coalition. During the 1994 convention, she presented a session on how to locate legislative information through the Library of Congress network by using the Internet.

The writer has gained telecommunications experience by having computer equipment in her home that contains an internal modem through which she can access the Internet by using the Unix system at Nova Southeastern University. She also belongs to the Southeastern Regional Vision for Education network or SERVE which provides online services to Alabama, Florida, Georgia, Mississippi, North Carolina, and South Carolina. This service has just recently provided Internet service to its subscribers. As of last year, South Carolina gave its schools a local electronic bulletin board service, called FrEd, or Free Educational Network. Schools that can afford to have a dedicated phone line and a modem in their media centers can connect to FrEd and use its services and resources. FrEd is a free service to any school able to use a local phone number to dial into the network. Unfortunately, the writer's school could not afford the installation of a phone line last year. Teachers and students had no opportunity to learn how to use a bulletin board service, or BBS, for E-mail and other communications. During an earlier project, fifth grade students showed how they could successfully conduct sophisticated online searches of an electronic card catalog by using strategic inquiry skills. While conducting this project, another problem became evident. If students and the faculty could have current and very recent

resources, they could use these resources to further expand their learning. The faculty could employ these current resources to enhance their daily classroom lessons. Students could use these current resources and materials to supplement their overall knowledge and the entire middle school curriculum would benefit from these expanded and updated resources.

Chapter II

STUDY OF THE PROBLEM

The problem addressed by this practicum was that the middle school curriculum required access to current information, but printed materials in the media center severely limited student reports and classroom projects. Although electronic databases were available at the school, students and teachers did not know how to access this information.

Problem Description

The resources available in the writer's media center do not have the information or facts that reflect the events of the 1990s. Any assignments that require current events information cannot be adequately completed from the materials found in this media center.

The branch libraries in the county also do not have this type of information easily accessible to their patrons. Their collections are extremely limited due to the size of those buildings. Their only reference materials consist of just one set of encyclopedias, published recently within a 1-year to 2-year time span. Each

branch has only one work station from which patrons can access the main library's card catalog. These residents have to travel to the main library to do any periodical research which may consist of using microfiche, microfilm, or a CD-ROM data base. This is definitely a hardship for many of the county's residents, students or adults. The next county has a main library with much better facilities. However, nonresidents have restricted access to this library. They must pay a fee to check out any materials from this other library and they also must travel more than 25 miles to get to it

Since the county has many residents who have very limited incomes, the expense of traveling any distance to access information is a hardship. Because middle school students cannot drive, they must depend on someone else to take them to these other libraries so they can find additional informational resources. Even the neighboring high school library does not have current or updated information for students from each of the schools to use.

Problem Documentation

During a typical 1-week period, this writer recorded how often students could not find any relevant or current information on assigned topics. An average of two requests per day could not be fulfilled because there was no available information for those students. The results of this survey suggest that the media center cannot provide current or relevant information to 14 patrons a week, or 56 patron requests cannot be

fulfilled during a month's time. Another aspect of this problem is that some patron requests can only be partially fulfilled because of a limited amount of available information on a particular topic. This occurs at least once each day.

After analyzing the results of the patron request survey, this writer conducted a collection analysis of the three subject areas for which students had the most difficulty finding information needed for their assignments. Those areas were science, technology, and social studies. The collection analysis was conducted by using the online card catalog and listing the publication dates of each book in the three subject categories. Each of the publication dates was recorded and then divided by the number of books within that particular category. The average age of the books within that subject area was then determined. For all three categories, the common age was 1986 to 1988. One must also take into account that the facts contained in a book published in 1986 are really 2 to 3 years older than the publication date (*Writer's Digest*, 1994). Therefore, anyone who needs current information for assignments addressing science, technology, geography, or social studies only has access to books whose information is 8 to 10 years out of date at this writer's school. The most recent medical and scientific discoveries cannot be found. No data on the shuttle missions, occurring after the mid-1980s, can be found in this media center.

For example, only three of the nine books on Germany discuss it as a unified country. If a typical class of 28 students was to be assigned the topic of today's

Germany, only three books would have current and correct information on the subject. So few books for a class of 28 students are not sufficient to give all the students the needed information. The media center has 18 books which provide information on the Soviet Union. Only four books, published in 1992, discuss the new countries within Russia.

Another aspect of this problem is that students and teachers have computerized databases available, but they do not know how to use them. This writer conducted a survey among 167 students in the seventh and eighth grades. They were asked if they had a computer at home, if they had modems with those computers, and if those modems were connected to any online services. Only eight of those students surveyed were not in level one classes. The level one classes contain only the brightest and most academically successful students in the language arts program. As a rule, most of the level one students also come from privileged and educated families. Only 70 students said they had a computer at home. Just 32 had modems with their computers and only 12 said they used these modems to subscribe to online services. For so few of these capable students to have such limited computer access to additional databases is really surprising.

Another survey was conducted among the faculty concerning their computer knowledge or experience. The results were not surprising. Only 3 of the 20 faculty members had modems that had accessibility to online services. Nine of the 20 had a

computer in their home. However, four of those nine faculty members had outdated Apple IIes that have very limited capabilities. The survey revealed that six of the nine staff members owned computers with no capabilities to reach external databases. Clearly they also were denied access to the most current and relevant information because they had no experience with online services or databases. Certainly, they had had no training in how to contact these online resources, nor did they have access to any equipment which could give them this capability. Only one of the teachers had a computer in her classroom. She used it only for data base management. Unfortunately her students could not use it.

Another aspect of this problem is that so many subjects in the middle school curriculum require students to know and use current information in their studies. For example, eighth grade math classes study the stock market and business trends. Their teachers assign them companies to chart and watch the market trends. It is difficult for students to find daily business information on their companies because the newspaper comes in the daily mail arriving after 1:00 p.m. By that time, their math classes are finished and they have missed what limited information was available to them.

The science classes experience similar problems. Students can find little relevant or current information in the media center concerning the causes for the recent disasters in the news. Japan's earthquake, India's avalanche, and the flooding in California due to *El Niño* weather conditions, could be excellent sources for student reports.

However, the media center has very few books on any of these topics. The only source of current information on these disasters is the one daily newspaper which is delivered late in the day. Finding recent and reliable information on teen health issues is another problem for the science department. Books which discuss anorexia, bulimia, sexually transmitted diseases, or AIDS are outdated or very limited in their presentation of factual information.

The social studies curriculum also experiences these same problems. Current events can only be found by using the daily newspaper or by students listening to the daily Channel 1 broadcast. Most students miss both of these sources of information. Therefore, the recent conflict in Chechen, Russia only can be followed or discussed a day after any new events have occurred.

Causative Analysis

Therefore, the problem consisted of many elements: (a) students had very limited sources of current information; (b) students had no training with computerized databases; (c) students had no experience with online services as sources to use in finding current information; (d) both students and faculty were not computer literate; (e) the faculty had no experience with online services; (f) faculty members did not have computers available either at school or in their homes; and (g) the faculty did not have any classroom computer work stations for themselves or for their students so that

daily classroom instruction could be enhanced by using larger data collection bases.

This situation is not surprising or unique for a rural middle school. Because reaching online databases is a recent development, smaller more isolated communities get these information services long after urban and metropolitan areas have them (see Appendix A). Students become discouraged easily, because they find few sources of current or relevant information. Often, they attempt to complete assignments without doing any research on the subject. Secretary of Education Richard Riley said, "Any roadblock to the information highway would make it absolutely impossible to educate the coming generation of young people in high standards of excellence" (Henry, 1994, p.D5).

Relationship of the Problem to the Literature

A review of the literature has shown that rural schools, due to their isolation, do not have the same access to informational sources as do urban schools. Dillman (1991) described how serious this information gap is for rural communities. Public schools, public libraries, nor extensions services are addressing this need. He said, "The information age means having precise information when and where it is needed" (1991, p.31). Rural communities have always seemed to value information coming from more traditional sources, *i.e.* family heritage, mores, and customs. How important the information age can be to these communities is largely overlooked and under valued

by the members within that rural community.

Barron (1991) described the needs of public libraries in remote areas, as "acute" (p. 46). These libraries are at a great disadvantage due to shortages in personnel and the size and quality of their collections. Besides the problem of isolation for rural libraries, there is also the problem of deteriorating book collections. Schuman (1991) described this as one of the major obstacles to literacy among rural and urban communities. Schuman said, "There is a widening gap between the information rich and the information poor" (1991, p.38). An equitable access to information is everyone's right in this country. This right is at risk.

The question is why are library collections no longer current and relevant? In the 1960s, Congress enacted the first Elementary and Secondary School Act, or Title IV. This bill specified that school libraries be given funds to increase and update their collections. However in the 1980s funding for school libraries was continually decreased. Without this Chapter IV funding, library collections in all areas of the country began to deteriorate. Rural school libraries and pubic libraries were especially hurt by this budget decline (Rogers, 1993). Now older or damaged materials could not be replaced or updated. Rogers reported that the new Elementary and Secondary School Library Media Act will remedy this situation. Besides the purchase of materials, it also addresses the need for teachers and media specialists to design learning units that require accessing information through the use of computers and

computer networks.

Although requiring teachers to use computers is well meaning. Few teachers are trained for this task (Niess, 1990; Harrington, 1993). In a 1994 summary of test scores for this writer's school, the state superintendent, also included the mean ratio of teacher experience. The typical teacher has 11 years of experience. This means that most of the teachers graduated in 1983. Computers had just begun to be introduced into the schools at that time. Most of the teachers at this writer's school feel that they have gotten along well enough without using computers for over a decade. They are extremely hesitant to begin learning how to use them to enhance their curriculum (Tobin & Dawson, 1992). These authors apply the term "myth" (p.81), to the belief that today's teachers are using any technologies in their classrooms. Kennedy (1988) used the term, "computerphobia" (p.297), and insisted that this problem is still with us today. He offered two reasons for this: (a) fear of technology is still prevalent and (b) fear of "blowing up" (p.298) the computer is a real concern among teachers.

Eisenberg (1988) wrote that students who do not have access to computers or to current information materials will not produce quality assignments as those students who have access to online catalogs or to online services. He stated that students who used online services had much greater sources from which to choose and their assignments reflected this wider access to information.

Two studies have further confirmed Eisenberg's observations. Loertscher (1993) reported that in 1991-1992, the Colorado Department of Education's study, *The Impact of School Library Media Centers on Academic Achievement*, published the results of data collected in 1988 to1989. Staff size and school library media budgets were studied. At each grade level, test scores increased as the school media library program's budget, materials collection, and staff increased. The study concluded with these words: " In the case of school library media materials, you get what you pay for in student achievement" (1993, p. 32).

Krashen's report, entitled, *The Power of Reading*, (1993) also agreed with the findings of the Colorado study. He concluded that having school library media centers with current, timely, and relevant materials for all school community members to access and use was essential to academic achievement.

A review of the literature has confirmed that rural libraries definitely need to be included in the same information services as urban areas have. However, many rural school libraries do not have current materials or the staff or budgets to offer these basic resources to their students or teachers. The literature further confirmed that the teachers themselves have no experience or access to computer assisted instruction. Finally, students who have quality school library media programs benefit from them and enjoy better academic success.

Chapter III

ANTICIPATED OUTCOMES AND EVALUATION INSTRUMENTS

Goals and Expectations

The following goals and expected outcomes were projected for this practicum. The general goal of the practicum was that students and faculty members would have current and relevant sources of information available to them in the media center by using electronic databases.

Expected Outcomes

1. By the end of the implementation period, 80 of the 100 fifth through eighth grade students, unassisted, will locate information about a specific topic through computer library access.

2. By the end of the implementation period, 80 of the 100 students will use a minimum of 10 resources obtained from computer information databases.

3. By the fourth month, 70 of the 100 fifth through eighth grade students will access the Internet and use its many databases successfully at least four times a month in their classroom lessons or research assignments.

4. By the end of the implementation period, 80 of the 100 fifth grade through eighth grade students can access the Internet.

5. By the end of the implementation period, 80 of the 100 fifth through eighth grade students will demonstrate how to retrieve information from online computer services.

6. By the end of the implementation period, these students will be able to name and use all the computer components needed for telecommunications services.

7. By the end of the implementation period, a majority of the 31 academic teachers will incorporate these online services into their lesson plans at least four times throughout this training period.

Measurement of Outcomes

Each outcome of this practicum was assessed and measured by using surveys, observations, interviews, tests, and the data from student folders. The media staff kept a daily log of what types of problems students and teachers were encountering when they attempted to go online. Any difficulties students and teachers experienced with the equipment or software was noted. Any problems in understanding how to use telecommunications during the time of in-service training was recorded in this log also. Then, an analysis all these measurement tools was used to evaluate each outcome's level of success.

Outcome 1. Students' use of computers to locate specific information was documented in their individual folders. These folders had a chart listing all the subject areas accessible from the online service. The media center staff monitored all student progress which was recorded in these folders (see Appendix C).

Outcome 2. Students use of a minimum of ten resources obtained from computerized databases was documented from that same chart found in their individual folders (see Appendix C).

Outcome 3. Students reaching the Internet and using its resources to enhance their studies and to conduct research was monitored by the media staff. Each time students used the online services for research, a tally was kept of this activity by the media staff. They were expected to reach the Internet services at least four times monthly without asking for assistance from the media staff. Also at the end of the implementation, a survey asked them what areas of the Internet they found most useful and how they used that information (see Appendix D).

Outcome 4. The outcome that 80 of the 100 fifth through eighth grade students could reach the Internet was documented in the charts of their individual student folders.

Outcome 5. The outcome that 80 of the 100 fifth through eighth grade students could demonstrate how to retrieve online information was measured by having the students perform these skills for the media center staff. The ability of each student to

demonstrate these skills successfully was documented in their student folder.

Outcome 6. The outcome that students could name all the computer components necessary for telecommunications and could explain their functions was measured by their ability to demonstrate this knowledge to the media center staff.

Outcome 7. The outcome of majority of 31 academic teachers incorporating the online services into their classroom lessons at least four times throughout this 8-month period was measured by the amount of faculty usage of these online services and the number of information requests received from the faculty. Each occurrence was noted in the log.

Chapter IV

SOLUTION STRATEGY

Discussion and Evaluation of Possible Solutions

The problem addressed by this practicum was that the middle school curriculum required access to current information, but printed materials in the media center severely limited student reports and classroom projects. Although electronic databases were available at the school, students and teachers did not know how to access information.

In 1988, the American Library Association published *Information power*. This book, futuristic and even a little optimistic for its day, stated that the true mission of libraries and their media programs "...is to ensure that students and staff are effective users of ideas and information" (p.1). How do students and staff become "effective users of ideas?" Obviously they must be trained in such skills. This training should be done by the media center staff.

In a 1994 letter to the Computer Learning Foundation, Vice-President Al P. Gore stated, "This nation cannot tolerate, nor can we afford, a society in which our children

lack access to information" (p.1). The National Education Goals addressed this same issue. One of its goals proclaimed, "The nation's teaching force will have access to programs for the continued improvement of their professional skills and the opportunity to acquire the knowledge and skills needed to instruct and prepare all American students for the next century" (*SCEA Emphasis*, 1994, p.9). Clearly having an online service would offer the most current information to both faculty members and students. However getting any online service is still a problem for most schools. A recent survey by the National Commission on Libraries and Information Science on public school media centers verified this fact. It stated, "Almost no school libraries have access to the Internet computer network" (Simon, 1994, p.2).

Although Townsend (1993) stated that South Carolina's institutions of higher learning have had access to telecommunications services since the mid-1970s, its secondary schools have had no such services. Today's teachers at the secondary and middle school level now are becoming aware of the possibilities that telecomputing can offer their students. Today the media industry markets programs such as, Kids Network from National Geographic, AT & T's Learning Link, and CNN's Newsroom to schools. Townsend (1993) stressed the importance of integrating telecomputing lessons into the curriculum at the earliest opportunity. These programs offer that possibility.

Wilson (1985) wrote that within the United States thousands of databases now

exist to provide immediate user access to information. She stated that this nation has the most technologically advanced communications systems worldwide, but is the 49th of 158 nations in literacy. She questioned the valuable of all this technology, if so many people do not have the fundamental skills and knowledge to use it?

Goodin (1987) conducted a survey to learn if younger students, having been taught search strategies, could remember to use these same skills upon entering college. His survey found that a definite transferability of these skills took place from one level of schooling to another. Kulthau (1987) conducted a similar survey among high school seniors who had been taught search strategies. Her findings concluded that these students developed logical and critical thinking skills by having had this training.

Hooten (1989) is another proponent of teaching students information retrieval skills so that they can then transfer these skills to online databases. Gratch (1989) agreed with Hooten and stated, "Today's youth must learn how to access many databases from a variety of online services" (p. 20).

Carpenter (1992) believed giving students online access to as many databases as possible was essential to their academic careers. Telecommunications must become a part of the daily classroom activities (Kurshan, 1990). Vaughan (1993) said that all telecommunications, not just online services, will be a necessity for daily life in a very few years.

Learning how to use a Bulletin Board Service (BBS) will also increase writing skills and provide an incentive to develop friendships with peers across the continent or across nations (Crowley, 1989; Harris, 1992; Hunter, 1990; Smith, 1985). Burrall (1992) further supported this idea by saying any students or school personnel who participate in electronic bulletin board services will share in one another's learning experiences.

Rooze (1989) also believed students should be taught how to search online databases. This skill will help them develop analytical and higher order critical thinking skills. He believed that teaching these information retrieval skills was fundamental in fostering their thinking skills. Dennis and Stadthaus (1991) were even more supportive of teaching information technologies to students. These authors found that student opinions, ideas, and outlooks changed after they had learned to search online catalogs and databases.

Casey (1990) used telecommunications as a way for middle school students to interact with their favorite literary characters. Graduate students or professors played these literary characters. The students would send them questions, comments, or offer solutions to the character's problems. The students and the "literary characters" both became better correspondents through this online service. Other students exchanged poetry online. This project fostered cooperative learning for science project ideas and for social studies reports.

Other researchers have used a BBS to help disabled students be more in touch with their surrounding world. Gandell and Laufer (1993) and Lefebvre (1992) used similar techniques to teach telecommunications skills to special-needs students. They each reported great success. They found their students to be very responsive to this type of learning and that their self-esteem, self-confidence, and academic skills were also enhanced by using telecommunications.

A review of the literature has revealed many positive ways telecommunications can enhance student learning and their academic skills. A further literature search has also confirmed that today's teachers can greatly benefit from learning these same telecommunications skills (Eisenberg & Brown 1992; Perez, 1992; McFadden & Johnson, 1993).

Evertson and Stafflings (1985) urged that teachers receive in-service training so they can use E-mail and other telecommunications skills within their own classes. These authors stressed that this training must take place in a non-threatening atmosphere. This ingredient is necessary and very important to the entire project's success. Teachers who are comfortable with a new teaching method will be more apt to use it. Others who feel insecure about this new method will not use it in their classrooms (Tobin & Dawson, 1992).

When teachers feel they are a part of the curriculum restructuring, they will employ these innovations within their own classrooms (Mandinach & Cline, 1992;

Knupfer, 1992). Schools must begin to give teachers technology to use in their daily instruction (Robinson,1991). She also recommended including teachers in staff development plans and allowing them enough time to learn these new technologies at their own pace.

Other authors have advocated the necessity of empowering teachers to make their own decisions about the use of technology in their classrooms (Budin, 1991; Snyder, 1988). Specifically Lare said, "Turn teachers into techies with 'computers to go' " (Lare, 1991, p.18). He stressed that unskilled teachers are not likely to promote any worthwhile instructional usage of computers. He reported on a Catasauqua, PA. project that paid its teachers to undergo this training and gave them take-home computers. Total costs for this program were less than $10,000 for the year. The money for this study was partially funded by a government grant and the remaining funds were provided by the Catasauqua Area School District. This program was modeled after the successful Kirkland, WA. teacher computer project of 1989. He included no results concerning the program's success.

So many recent studies have focused on the importance of the teacher's role in incorporating technology into the classroom curriculum. However, each study always mentions the importance of first training that teacher in the operation of the equipment, the capabilities of the software, and the need to simplify the technologies (McCarthy, 1988). In-service training for educators is the most important ingredient to

successfully incorporating technology into schools (Barger & Armel, 1992; Robinson, S., 1991; Clarke & Murphy, 1989; Congress of the United States, 1989).

Harrington (1993, p. 5) wrote, "How teachers perceive technology influences how well and to what extent they will incorporate it into their educational program." Niess (1990) stated that training has to start with the teachers first. They must be prepared to use technology, be competent with it, and comfortable enough to be able to incorporate aspects of it into their classroom curriculum.

Besides providing training for teachers in telecommunications skills, students must also be given these same skills. Mancall, Lodish, and Springer (1992) believed that students must be comfortable with computers and the programs on them. If students are to use the media center effectively, they must be trained in the technologies of the center. When trained, they can begin to use effectively and efficiently all the databases located in the media center (Maples & Jones, 1991). Romm (1993) stated that having these information retrieval skills will be essential to students throughout their lives. She also felt that not only would these skills be used in their academic careers, but also as they entered the work force, be it immediately upon high school graduation, or after finishing college.

Wurman (1989) is another advocate of teaching students how to use online services early in their academic careers. He believed that it would be essential to their earning capabilities, because the amount of information doubles every 8 years.

Teaching students how to use online services to retrieve the most pertinent and recent data is a task for the media center (Handy, 1993). Still, other proponents for giving students this training are Eisenberg and Brown (1992). In an address to the American Library Association Conference, they stressed that all media specialists must consider it a mandate to empower students with this skill. Often the only opportunity to use electronic databases is in the school media center and not at the local public library.

Two states have published complete curriculum guides to help school media centers cope with this problem among students. The two states are North Carolina and Pennsylvania. These curriculum guides were developed in 1985 and are still in use today. The North Carolina guide, *Library/media & computer skills, Grades K-12* (1985), stressed that these information skills be totally integrated into the entire curriculum. These skills should not be separated from any other academic skills. *Pennsylvania online* (1985), a curriculum written by the State Library of Pennsylvania, has also addressed the need for today's students to be computer literate. Its lesson plans even suggested the kinds of materials and resources which the media specialist should present. It includes "achievement levels" (p.9) and evaluation guidelines. As a further argument, *Pennsylvania online* uses a quotation from the National Commission on Libraries and Information Science, "...children (should) learn how to find and use information effectively. This skill is seen as the 'fourth R' and is essential in the learning process from cradle to grave" (p.34).

Buboltz and Ling-Louie (1991) wrote that school media centers should have a variety of databases for the students to use. They further stated that students must also develop skills in collecting data. Then they must learn how to interpret this data and evaluate its relevance to their needs. Teaching students how to evaluate the pertinence and relevance of the data they retrieved is yet another facet of this skills-building process. Rux (1991) believed that particular kind of training and knowledge was very similar to using the scientific method. He stated that as students progress through this scientific method, they would develop writing and communication skills. They also would learn how to compare facts, contrast ideas, and form conclusions.

All of the literature previously cited has advocated that the traditional school library acting as just a repository for books, can no longer exist. The media specialist must become pro-active and aggressively teach all patrons how to use online services. The literature has also suggested that teachers must receive some extensive in-service training in these new technologies. In this way they can become proficient in using these telecommunications services for themselves and for their students.

Description of Selected Solution

Potter (1992) chose to use telecommunications with middle school students to improve their reading skills. She said it motivated her students, developed their confidence, and improved their computer literacy skills. Potter's students used

electronic bulletin boards to contact overseas pen pals for doing comparative literature studies, joint literacy publications, and creative writing exercises. She further stated that the teachers of these students also benefited from this project. Using telecommunications in their classrooms allowed them to develop different delivery methods of instruction in both the teaching of reading and writing. This project was a definite teacher-empowerment tool.

Hunter (1990) strongly advocated the use of local area networks and electronic bulletin boards. These services would benefit both students and teachers in their need for collaborations, learning, and idea exchanges. Several states, such as California, Florida, North Carolina, Tennessee, and Texas have successfully incorporated the use of E-mail into their schools (*Weiss*, 1994; Andres, 1993; Stout, 1992; Southern & Spicker, 1989; Sullivan, 1989). These networks have enjoyed a record acceptance by the educators. Hunter (1990) reported 1000 new users apply for an account weekly. She stated that now telecommunications projects are accepted and ongoing parts of Texas education.

The literature recommends teaching telecommunications skills to students to improve their thinking and communications skills. It is a way for educators to talk with other colleagues. It also can empower them with techniques which may improve or change their instructional skills.

Lever (1991) suggested a plan for "assisting" (p.3) the educator in using

technology. She suggested creating a program to provide teacher training in a workshop format. Each teacher should be given a description of the workshop and a list of objectives as they register for this workshop. Lever (1991) stressed that handouts should emphasize the major points presented at the workshop. The purpose of these handouts is to relieve the participants from having to record all that the instructor says and then perhaps miss other information. Each workshop session should have a definite start and finish. Adhering to a strict schedule helps to keep everyone at the workshop focused and ready to learn.

Lever suggested that each workshop only feature one new technology and the concept should be interesting to the entire workshop audience. She believed better audience participation takes place if only one technology is presented. She also felt interested participants are likely to use this new learning tool long after the workshop has ended.

Lever believed training the faculty to try new technologies would have many benefits. These technologies would help to improve their daily lesson plans. Success seems to breed more success. In other words, faculty members who use technology effectively become models for their colleagues. They will become the mentors and support groups for other faculty members.

The trainer must continue to keep in contact with the workshop participants personally and act as a mentor, troubleshooter, and resource person. The faculty

members will need this support as they develop the necessary skills to incorporate technology into the curriculum. In her final recommendations, Lever urged that there must always be a match between "faculty needs and appropriate technology solutions" (p.12).

Ely (1990) stressed several ways to introduce and train the faculty to be innovative. His steps were these: (a) instill the knowledge and skills with which to implement change; (b) provide ample time for in-service training; (c) focus on the rewards or incentives if these changes take place; (d) expect and encourage complete faculty participation; (e) emphasis full support and commitment for those who implement change; and (f) enthusiasm and encouragement must be voiced from the executive officer and from the project leader to those carrying out the innovations (p.300). Smith (1992) advocated giving teachers released time to attend workshops which featured new technologies. She stated that teachers need ample time to practice using computer assisted instruction. Work sheets should be provided, so teachers can work through the programs at every level. She urged limiting the number of participants. This would give the presenter enough time to interact with the participants and to supervise their individual efforts.

Ely also suggested teaming teachers who have little computer experience with a more skilled partner to help instill confidence and diminish any fears of embarrassment. She reported that the workshop members who quickly worked

through the various programs were then available as tutors and mentors for those who were experiencing difficulties learning the new methodologies.

Many methods proposed for training teachers are also applicable to students. Ala and Cerabona (1992) said that teaching a student how to search online for information effectively gave that student a "life skill" (p. 42). This skill always be used by that student in any future career. These authors suggested teaching this skill in a small workshop format. Previously trained students could help the current workshop participants. They successfully had used work sheets designed as a scavenger hunt game to help stimulate interest and competition in finding the correct answers from the online database. Romm (1993) used a study unit of 12 true to life problems she called, "Researching for Life" (p.20). These problems spanned job transfers to buying a used car, clothes, or finding just the right quotation for a close friend's wedding ceremony. Every situation called for finding the correct reference materials to resolve the situation. She designed this unit for students who were not college bound and would need these informational skills as they entered the job market after high school graduation. This unit of study also emphasized to these students that the need for information does not stop when academic careers are completed.

Pawlowski and Troutman (1991) stressed the use of help posters and using student leaders to help at various work stations when teaching students how to search online. They also used taped instructions at the work stations and tutorials to help

students in learning how to access online databases. The article cited a Department of Labor report of 1991 which stated what skills the future worker must have to compete in a global economy. Valenza (1992) urged using meaningful topics for classroom assignments. Then students would learn how to search electronic databases for relevant information. The article stressed the importance of the media specialist and the classroom teacher working together to develop meaningful assignments. These assignments would require students to use online resources to complete their projects.

This writer decided to try the following approaches to train the faculty and students at her school. Students and teachers will be introduced to different areas of the Internet. The teacher's manual which is included with the Classroom Prodigy Service offers suggestions for eight major curriculum areas. Within these eight curriculum areas are as many as 18 activities. These activities vary in difficulty and appeal to many interests. The suggested online activities begin at seventh grade level and progress to the twelfth grade of high school (*Classroom Prodigy Service*, 1994). This service has enough diversity to keep student and teacher interest peaked as this project develops.

Most middle school students have heard about the superhighway, or the term, "Internet". However, they do not understand the concept or how it will change their lives. During January 1994, Channel 1 presented a program explaining to students

how the Internet operated and its impact on their futures. This writer recorded that program, The Information Highway, and showed it to each group of students during the first session of training. This writer also recorded a second program entitled, Global Quest: Using the Internet in the Classroom, for use with the faculty. NASA had produced this program to illustrate the value of online communications. It explained to teachers how using the Internet could benefit them and their classes in many different ways. The narrator of the video explained how his class talked by means of E-mail to a scientist in Antarctica. The scientist explained to the class how he had just been outside his igloo when a group of penguins approached to examine him closely. The scientist told the class how surprised he was that these penguins had absolutely no fear of approaching him. That class will remember that online experience for a long time.

This video should convince the faculty to allow their classes to use online time. Classes could use E-mail to correspond with other schools, with experts in scientific fields, or with business professionals.

At first, the media center staff introduced students and teachers to the idea of E-mail by using the Prodigy communications center service. Teachers were to have many practice sessions so that they would feel comfortable with this new activity. The writer also encouraged teachers to use the South Carolina network service called Free Educational Electronic Mail (FrEd). The students remained on the Prodigy

communications center until they have enough competency to use the FrEd network. Every student recorded what Prodigy feature he or she had used the during the training sessions in their individual folders. New lessons were introduced weekly. In this way students learned about the far-ranging capabilities of the Internet.

In one of the writer's previous projects, she created an instructional tape that was always available at the work station. Students frequently played this tape to help them remember how to conduct keyword searches (Christy, 1994). This writer again created another tape explaining how to use Prodigy and its online services. In addition to the tape, students and teachers received a small manual of the most frequently-used terms referring to the Internet or to online communications (see Appendix G). This writer also followed the advice of Pawlowski and Troutman (1991) and had help posters with simple directions, and the Prodigy features menu at the work station.

All of the training sessions involved small groups, or a learning partner. These small group sessions focused on any common problems students were having as they used the Prodigy service. Any other problems they experienced as they corresponded with key pals was discussed in the small group training sessions. Five hours or more of online time was available each day. The sessions always started with a discussion activity or a review of the previous session. This really helped students before they started their online searches. Students learned how to search effectively for online information. Activities focused on increasing vocabulary and using alternative words

or terms as they searched online. A thesaurus was also available at the Prodigy work station to help students use alternate terms or words as they searched for online information.

A daily log recorded any continuing problems or unexpected events as students and teachers learned how to use these new services. This log was very useful for recording the comments of participants during the training sessions. This writer also recorded how the training sessions progressed and how these sessions could be improved. It was an invaluable tool which assessed student and faculty progress throughout the implementation.

This training took place in the media center. Students and staff used the online services of Prodigy for up to five hours daily. They also used FrEd for local E-mail correspondence. The Prodigy service was available on a multimedia work station in the media center. FrEd was available on another work station. This writer taught all of the training sessions. She and the classroom teachers determined when these sessions occurred . The sessions lasted approximately 25 to 30 minutes and took place at least two to three times a week. It was necessary that frequent training sessions took place so that all of the expected learning goals could be accomplished.

Small groups of teachers were to learn how to use the Internet, through the Prodigy service. They would also learn how to use the FrEd mail service. They were to have these training sessions during their planning times or at their convenience.

Training for each group of teachers was to continue until they felt confident enough to use the online services unassisted. After the teachers had received their training, the media staff still continued to encourage and help them plan classroom projects which used online services. Sullivan (1989), Ellington (1991), and Weiss (1994) all have written that giving educators access to online services allows them to accept telecommunications as an essential and integral part of their curriculum.

The Prodigy service allows 100 hours of monthly online time. Therefore, this writer expected to have ample opportunities for students and teachers to use, to explore, and to learn about telecommunications. These services could offer teachers and their students continued learning

The media center advertised the availability of these new online services by posting signs around the school which told students and teachers of the new services in the media center. A slogan posted throughout the school, urged students and teachers to come into the center and try out the Internet (see Appendix H). A banner, depicting the world, with the slogan, "Navigate the Net" was displayed above the Internet work station. When students and teachers completed their training, they received a button with the same picture and slogan as the banner. This button was to generate an interest among others to receive this telecommunications training. Publicity about this telecommunication project also appeared in the local papers and kept the community informed of these learning activities.

This writer believed that by giving Internet training to middle school students and to their teachers, all would become comfortable navigators on the information superhighway. This is a highway that will connect schools, people, and businesses into "virtual communities where people work together, even if they live in a different state, time zone, or country" (Allman, 1993, p. 58).

Report of Action Taken

Shortly after the new multimedia work station had been purchased, the second phone line was connected, and the Prodigy online service was installed, this writer started to tell the faculty individually that an Internet service was now available. Most of the teachers greeted this announcement with a look of puzzlement. One even said, "What's the Internet?" Because of that comment, this writer knew that extensive training with in-depth explanations had to be done before the faculty would readily accept using the Internet service for themselves or with their students.

At a faculty meeting, the entire staff learned an Internet service was now in place. Later that day, the NASA video which explained the Internet and the learning opportunities it presented to teachers and students was broadcast throughout the building. Teachers received information packets in their mailboxes which had a sign-up sheet for the Internet training, and copies of an article in which teachers explained how they had used the Internet in their classes. This writer encouraged these teachers

to be trained with their team partners or within their grade levels. The literature had stressed that being trained in a small group was much less intimidating to teachers than being trained alone. When only a few sign-up sheets were returned, the writer distributed a features menu from the Prodigy Classroom service which grouped programs by subject areas. In the weeks that followed, teachers also received pertinent articles on the Internet, its current uses in an educational setting, and how it could be used to promote learning. Unfortunately, not many teachers wanted to give up their planning periods to come for this training. Although the principal had said he would strongly encourage the staff to learn how to use this service, after that first faculty meeting, he did not mention this service to them again.

However, there were four teachers who were curious enough to come and learn what was available on the Prodigy service during that first month. Even though the writer urged many others to come and explore the Internet's possibilities, after an initial first time, only two teachers returned to continue using this service. One of those teachers was the same person who had asked about the term, "Internet." Eventually these teachers decided to pay for a subscription to another Internet service which they used during their planning periods.

After the teacher training period had ended, the students began their training by grade level. They were shown a Channel One News video which featured a student explaining how the Internet would affect their future lives and their careers. This

writer also connected a large television monitor to the work station's monitor so groups of students could easily see how to access Prodigy and also how to use its different features. By having this device, groups of eight students could easily participate in the instruction. This device also enabled the writer to monitor what a student was doing online, without having to be there constantly. Therefore, no windows icons were ever deleted from the program and no unauthorized playing of computer games took place.

At times, small groups of students would come into the center for Internet training without being scheduled beforehand. This created somewhat of a problem, because these groups would have to wait until the connection was completed with Prodigy. It seemed that once businesses and industries logged onto the Internet, then the access lines were all busy. Sometimes, it would take 15 minutes for the modem to actually make the connection to the service. Therefore, this writer encouraged the teachers to schedule their classes into the center beforehand, so she could begin trying to reach the service before the class arrived. Weather also became a factor in getting into the Prodigy service. If it was raining, many times the modem would not make the connection. One time, both of the phone lines were cut because construction crews were laying cables for a satellite dish. The writer soon found out that it was always best to get online before school started in the morning. In that way, if there were any problems, perhaps they could be resolved before classes started arriving for the

training.

Each student had a folder with a chart listing the Prodigy menu and also a Code of Ethics statement (see Appendix B). The writer required every student to sign this statement before he or she could use the online service. At the end of each class session, they recorded on their time management charts what Prodigy features they had explored. At times these training sessions could last 30 minutes or more. One class of resource students came in two days a week for 45 minute sessions. Their teacher always accompanied them and participated fully in the training also. This writer found that these students really enjoyed taking turns reading the text on the screen to each other. The colorful graphics of Nova and the National Geographic features really held their interest and kept their attention.

Other students stayed after school to receive the training because their class schedules did not allow them enough time to come during the regular school day. They also had student folders, signed the Code of Ethics statement, and recorded the Prodigy features they used.

The most successful projects were those which involved key pals. Several grades took part in these activities. The first project started in March with a group of Florida high school seniors. These students were already using part of their school day to work in jobs which they were considering as future careers. They were under the direction of Mary Black, another doctoral student at Nova Southeastern University.

Since this writer and Ms. Black were studying the uses of technology, they planned this key pal project together. The writer matched fifth and seventh-grade students by their career interests to the Florida students. Each group exchanged a video tape which introduced themselves to their future key pals and told what career they were considering. This writer took a Polaroid photo of each student to send along with the video. She thought this would make writing to an out-of-state person seem a little easier. The Florida students did the same. They acted as mentors encouraging the younger students to strive always to do well in school and gain an education for any career they wanted. During this project, this writer arranged to take the group of 24 students to see what the FrEd Network actually was and where the Systems Operator was housed.

FrEd was not too impressive. It is a MacIntosh computer programmed to send the day's messages overnight to the next node which eventually links up to the mainframe computer in Bonita, CA. However, the main reason to visit FrEd was for these students to actually see a demonstration of how E-mail is sent and that it definitely is not private. They took turns E-mailing messages to this writer and saw that message displayed on the other computer's screen located in the same room. What was more exciting for them that day was a tour of the Instructional Television (ITV) studios, also housed in the same building at the University of South Carolina. The production crews showed them how to operate the sound controls, mixers, TV cameras, and they

saw their images projected on multiple monitors. That was the highlight of the trip.

As one of the closure activities for this project, the middle school students each sent a thank you note to their key pal person. Attached to that thank you note was the Internet Navigator button as a farewell gift. One of the nicest letters E-mailed to a fifth-grade student came from Kristina in Clearwater, FL. She said, "...As long as you keep focused on school and your dreams, you'll succeed in everything you put your mind to. I'm always willing to listen or answer your questions."

Other successful key pal projects involved sending welcoming E-mail messages to the incoming fourth-grade students. This involved matching each fourth-grade class to a fifth-grade class at the writer's middle school. Each of the 180 fifth-grade students E-mailed a short message to the 180 fourth-grade students. The purpose of this project was to resolve any fears that the younger students might have about coming to a much larger, older, school which also had students in the seventh and eighth-grades. As a closure activity, this writer hosted a "Meet Your Key Pal" party when these students came to tour the middle school. Here was a chance to visit and ask any other additional questions. In order to get so many letters transmitted over to the primary school in so short a time period, both online services, FrEd and Prodigy, were used.

Another similar project was developed between the eighth-grade students and the district high school's Juniors. Some of the eighth-grade students were not anxious to leave the security of the middle school. Like the fourth-grade students, they had heard

rumors of how difficult a new school would be. This writer, two middle school teachers, the high school media specialist, and the teacher of these Juniors worked together to develop this project. Approximately 38 middle school students received encouraging E-mail letters from these high school students. These messages seemed to calm their fears about the difficulty of finding their classes in a new building and also about the difficulty of new course work. In a closure activity, the two teachers and this writer took the middle school students over to the high school for a tour conducted by their individual key pal person. While refreshments were being served in the library, they listened to a welcoming message from the assistant principal. This also was the same place where the high school students had transmitted their letters to the middle school students using the FrEd Network. Once again, the middle school students could use both of the online services to respond to the high school messages.

During the last month of school, a team of five eighth-grade teachers combined lesson plans so in each class, students would learn what historical events took place in cities and towns throughout South Carolina. Each student had to make presentation materials featuring a particular city or town. Then they were to explain some facts or historical events which were a part of its history. When the teachers asked the media center staff to help locate resource materials for their students, this writer suggested a Prodigy feature called, "Mobil Travel Guide." This feature lists the tourist attractions and history of all major towns and cities in each state. Quality ratings, cost, and the

location of these restaurants and hotels in each city are also given. This particular feature proved to be an invaluable resource for their study. The students found facts about their assigned cities that could not be gleaned from any other sources in the media center. Once more they were able to locate this pertinent and timely information quickly without having to use other reference materials.

During the last week of school, the media center sponsored a scavenger hunt game on the Internet called, "The Big Net Hunt" (see Appendix I). The game was open to all students. Anyone who answered nine out of ten questions correctly, won a prize. Several of these prizes were new paperback books which had been part of this past year's book fairs. Some students came during their recess times, either alone or with a partner. This activity generally took 30 or more minutes to complete. The questions were designed to test the student's skill in accessing various parts of the Prodigy service. None of these questions were drawn from specific current events which could easily disappear within a few days. There were two different versions of this game so students would not exchange answers among themselves.

Finally, during the last two weeks of May, the local cable company began to broadcast an announcement that Internet training would be available during the summer to any interested parties. This announcement was shown once every hour on the weather channel. It also told the audience that this training was free and gave the writer's school name, phone number, times, and which days the training would be

available. Prior to the televised announcement, I had given the school secretary an information sheet which gave more details of this training. She could then answer any questions callers might have. If the calls came in during the school day, she simply directed these inquiries to the media center. Several people did call. One of the first questions they always asked was, "Is the training really free?" The only stipulation was that they make prior arrangements if they were coming with a group of five or more persons. But this never happened. The largest group of participants came to the first summer session. It was a group of four senior citizens who had traveled over twenty miles to receive this training. Although they did not plan on subscribing to Prodigy because it did not offer them a local telephone number to use, they definitely wanted to learn about the Internet. Another Internet service was available in their community with a local number. However, this service did not have the colorful graphics of Prodigy because it only transmitted in monochrome. These senior citizens stressed to the writer that they would not pay the additional cost of using a service that could not provide a local calling number. The fifth person to attend that first session was a nurse. She already had an online service but wanted to learn more about what medical information she could obtain through the Internet. Having the use of a TV monitor to project what the computer monitor was displaying really helped during this session. Each participant received information comparing the different Internet systems which appeared in *PC Novice* (May, 1995). They also received information

on the general history of the Internet and what equipment is required to reach it.

During subsequent sessions, this writer soon learned that the participants also brought valuable knowledge and tips to share with everyone. During every session, the other work station which had access to FrEd was also available for anyone to use. Purposely, the writer displayed the phone directory so the audience could see that both county libraries had online card catalogs. Very few of the 15 summer participants knew of this service, so they were also happy to learn about another way they could use their home modems.

Whenever people came for the Internet training, they generally stayed the entire three hours. One of the participants E-mailed this writer after the sessions saying, "Just wanted to say thanks for teaching me about the Internet. It's going to be lots of fun. Have a great day. Marty...". Needless to say, "Marty" was a quick learner.

Some days no one came for the training, especially during the last weeks of the summer vacation. This was for the best because the air conditioning system was being updated and was never working during the training sessions. It seems that new timers were being installed to increase the system's efficiency. However, these new timers never worked. The temperature stayed at 90 degrees in the center during those days.

When school began in mid-August, one of the principals from the other middle school approached the writer and said, " I saw that ad on cable, I just wished I had had the time to come over for the training." Frequently this writer heard those same words

from several people during that first week of school.

During the final two weeks of this practicum, several teachers came in for the Internet training. Some just wanted to learn how to send and receive E-mail. One had purchased a computer already loaded with Prodigy. He wanted to see what it had to offer, before signing up for the service. A few days later, he came back to tell me how many former teachers and classmates he had contacted through E-mail. He said, " I love it and I don't have to pay Ma Bell!" Another student who had been part of the Florida project came into the center to ask if other similar projects were being planned for this year. He said that he had enjoyed that project, especially learning how to send E-mail messages. Many of the students from the writer's school still are writing to their key pals in Florida. One of the fifth-grade students received a colorful sign wishing her "Happy Birthday" from her Florida key pal person. The student was so proud of this sign, she made a special trip into the media center to show it to this writer.

After evaluating all of the programs made possible by using online services, the writer would rate the key pal projects as the most successful. These projects seemed to give the participants a feeling of self-esteem, worth, and confidence. Corresponding with other students in other situations was a great experience for each of them. More of these types of projects are planned for the coming school year.

CHAPTER V

RESULTS, DISCUSSION, AND RECOMMENDATIONS

Results

The problem addressed by this practicum was that the middle school curriculum required access to current information, but printed materials in the media center severely limited student reports and classroom projects. Although electronic databases were available in the media center, students and teachers did not use these databases to locate current and useful information.

The solution strategy was to train students and teachers how to use these electronic databases and online services. This was accomplished by offering in-service training sessions to the staff and also scheduling students into the center to learn how to use these online services. The students had the opportunity to use the Internet to learn several ways of acquiring relevant information. They also learned how to correspond with other schools by E-mail. Most of these schools were within the school district, but one was in another state.

The following outcomes were projected for this practicum:

1. By the end of the implementation period, 80 of the 100 fifth through eighth

grade students, unassisted, will locate information about a specific topic through computer library access.

This outcome was met.

Ninety-one students were able to find computer-accessed information, unassisted. Information was found by using the online service, Classroom Prodigy. Students used information found in its Quote Check feature to report on the price fluctuations of certain stocks to doing research on what parts of the brain are affected by Alzheimer's disease. Most of the time, students used Prodigy to complete homework or classroom assignments.

2. By the end of the implementation period, 80 of 100 students will use a minimum of 10 resources obtained from computer information databases.

This outcome was not met.

After groups of students received their initial training on the Internet service, they did not return to explore more Prodigy features. Teachers would bring their classes into the center to research a specific assignment; these students had no extra time to investigate additional resources found in other databases. Teachers are on a very strict time schedule and they allot a specific amount of time for an entire class to do research in the media center. Therefore, very few students ever had the opportunity to return to the center for more research once the class had come for a one-time study session. Additional sources of information were not used by these students.

3. By the fourth month, 70 of the 100 fifth through eighth grade students will access the Internet and use its many databases successfully at least four times a month in their classroom lessons or research assignments.

This outcome was not met.

Although by the fourth month, 70 students in various grade levels had received the Internet training, they did not continue to use the online service. Once again many of the same reasons, already mentioned in the previous outcome, were also contributing factors to this outcome not being met. Another reason to consider is that the faculty, as a whole, had not made any effort to learn about the Prodigy service. Since they were unaware of how valuable this resource could be for their students, there was no reason for their students to use it.

4. By the end of the implementation period, 80 of the 100 fifth through eighth grade students can access the Internet.

This outcome was met.

The actual number of students who participated in the E-mail projects was 240 students from the writer's school. Another 210 students from the district's high school and primary school also learned how to use the Internet to communicate with the writer's school. The classroom teachers felt that these key pal projects were valuable for the further development and practice of their students' reading and writing skills. Therefore, they allowed their students to miss some class time so they

could come into the center and transmit their messages. These projects had the greatest number of student participants. These key pals became ambassadors of goodwill and helped to promote a better image of this middle school.

5. By the end of the implementation period, 80 of the 100 fifth through eighth grade students will demonstrate how to retrieve information from online computer services.

This outcome was met.

After each group of students had completed their Internet training, they would be asked individually to demonstrate: (1) how to activate the modem to reach Prodigy or FrEd; (2) how to log onto the service; (3) how to access the desired menu or feature; (4) how to move from one feature or menu to another; and (5) how to disconnect from the service by returning to the start up menu. All of the students who had received the Internet training were able to complete these tasks successfully.

6. By the end of the implementation period, these students will be able to name and use all the computer components needed for telecommunications services.

This outcome was met.

Once again, at the end of the Internet training, each student was required to name each of computer components needed to have an online service. At the beginning of every training session, this writer reviewed what had been learned previously. This review always included the class naming all the computer components needed for

Internet service. It was no surprise to this writer that every student involved in the training was able to successfully recall all the required equipment for Internet access.

7. By the end of the implementation period, a majority of the 31 academic teachers will incorporate these online services into their lesson plans at least four times throughout this training period.

This outcome was met.

The actual number of academic teachers who used online services in their lesson plans was 24. However not all of them were from the middle school. Six teachers from the primary school and two teachers from the high school used the FrEd Network for key pal activities which linked the writer's school to their schools. The 16 middle school teachers used the Prodigy service for social studies projects, science lessons, current events, language arts activities, extra credit projects, practicing letter writing skills by using E-mail, and learning word processing skills. This school year FrEd is being used daily by students to learn what happened historically on that day. This information is then used in the daily morning announcements.

Unexpected Outcomes

Each month, this writer and the high school media specialist jointly wrote a short column on technological developments for the district's newsletter. This became an opportunity to write about how both online services were being used. In one article,

the writer encouraged teachers in other schools to ask their media specialists about using FrEd for their own class projects. Of course this writer was completely aware that only three of the 13 district schools had the FrEd service. Shortly after that article appeared, two other media specialists called to ask how to get a phone line installed in their centers. Their principals had read the article and wanted their schools to also have some form of telecommunications.

When they had the phone lines installed, this writer went to their schools and taught them how to log onto the FrEd network so they could then instruct their teachers. Another two media specialists came to the writer's school to see a demonstration of FrEd and also of Prodigy. By the end of the school year, 12 schools now had FrEd.

Another surprise was the opportunity to show all the students involved in the Florida project how real-time communication could take place online. This occurred one week when Alpha, Nova's communication network, remained accessible during daytime hours. Arrangements were made ahead of time for other Nova students, who knew about the demonstration, also to be online. The class saw how the monitor's screen became a forum for a two-way conversation. One participant would type a message at the top of the screen and the other person would answer on the lower portion of the screen.

The third unexpected outcome was that a cable company agreed to broadcast

a public service announcement on one of their channels. Originally they had told this writer that they no longer provided that service for the community. However, the station manager changed his mind when he heard what kind of announcement it was. He was impressed that the Internet training was to be a cost-free public service for any interested viewers. The announcement was shown at the bottom of the screen for a period over 2 months. Of the 15 people who attended the summer training, 11 had seen the televised bulletin.

The final unexpected outcome was that another middle school in the writer's school district will also subscribe to the Prodigy service for this school year. That principal had been impressed by the results of the Internet projects generated at the writer's school and wanted his school to have these same opportunities. He asked his media specialist to attend a training session and get all the information and costs from this writer. She came to a summer session and then decided this was something her school should have also. Her students and faculty will definitely benefit from having this service available.

Discussion

The enthusiasm of the students who participated in the various projects and training sessions compensated for the lack of interest by most of the teaching staff. The summer participants who were mostly adults definitely showed great interest in

learning about the Internet and how it could benefit them. At first, this writer was somewhat disappointed that only 15 people came to these sessions. However, of those 15 people, two were media specialists from the writer's school district, one was a former student getting ready for college, and one was another Nova Southeastern University doctoral student who was considering doing a similar project at her own school.

Although the media continually speaks of the information superhighway or Internet as if everyone has access to it, that simply is not true. It is another "myth". The median income of this county is only $14, 535 per year. Families in that income range are certainly not going to be able to purchase a computer, modem, printer, and an online service so they can reach the Internet. Recent studies have confirmed that only 39 % of families own a personal computer. Their incomes also exceed the national median income of $32,000 (Ramstad, 1995). Although there were televised announcements of these Internet training sessions, very few residents could actually take advantage of them. Most members of the community simply do not have the financial means or the equipment to even consider this informational opportunity.

However, students must be given this option. Learning how to use computers and reach online services for communication, research and information will be a future job requirement. Today, 87 % of the Fortune 500 companies use E-mail for personal communications (Hall & McLean, 1995). One educator said that E-mail produces,

"...a certain thoughtfulness and reflection that you often cannot afford in real-time face-to-face interaction" (Walther, 1995, p.11D). Students should be introduced to this skill early in their academic careers. They must become comfortable with it and learn to use it often. Having the Prodigy service made their exposure to this skill possible. Hopefully more teachers will use these online services to help develop critical thinking skills among their students and also as a source to promote better research skills.

In researching the literature for this project, the writings of Budin (1991) and Vaughan (1993) accurately emphasized the importance of using telecommunications and online services in daily teaching. The motivation which Burrall (1992) described students acquired because of these electronic tools also was witnessed in this writer's study. These students no longer considered searching online for more current and reliable information a boring chore. They actually enjoyed engaging in a kind of scavenger hunt to find even more information on their assigned topics.

The advice which Crowley (1989) gave in her article concerning how to start a key pal project also was very helpful and certainly most appropriate for middle school students. The information which Ely (1990); Evertson and Stallings, (1985); and Gratch (1986) offered concerning helping teachers cope with learning new technologies was timely and definitely accurate. The attitudes and problems these authors had encountered with their teachers were some of the same problems this

writer experienced. In 1988 Kennedy used the term, "computerphoebia" (p. 297) to describe the reluctance of teachers to re-train themselves to use technology. His term is still very relevant today in describing teacher attitudes towards computers and online services. This writer learned that teachers do not readily embrace technology in their classrooms. The "myth" that Tobin and Dawson (1992, p. 81) use when referring to teachers happily using technology within their curriculum, is just that, a "myth". This writer found that the advice and experiences of the authors cited in the literature review were very relevant and pertinent for this practicum project. Their findings and similar experiences helped this writer understand some of the results and conclusions of this practicum.

Recommendations

The importance of giving students learning opportunities which encompass the best resources possible is vital for their education and futures. Information changes and evolves too quickly to simply rely on printed materials. Having the ability to reach online databases for immediate information is essential in today's economy.

This writer would recommend the following items and methods to anyone who might be interested in duplicating this entire project or parts of it.

1. Get a commitment from your principal or supervisor that this project will be completely supported by the administration. Also have an agreement that during its

entirety this administrator will encourage the staff to get this training and to use it to introduce new teaching methods or resources into their curriculum. Without a supervisor's support, it will be an uphill battle to convince any staff to learn new skills.

2. Introduce students to the on screen communication menus before they actually have to use them. This can easily be accomplished by printing these menus off the screen. Then make transparencies of these print outs to use with the class. Make a transparency for each menu. Then they will understand how they begin E-mail and how they will end it by sending their message and logging off the system.

3. Have students work with a partner when composing E-mail messages. Each partner can take turns helping the other check for spelling and punctuation errors. Frequently, younger students are so involved with the mechanics of typing that they forget to check for mistakes appearing on the screen.

4. Attach a document holder or stand to the monitor at the work station. If they have written their message beforehand, they will have somewhere to place their paper for easy viewing.

5. Usually "Address Books" are part of the utilities within the online's communication center. If students are writing to the same person or school often, enter its full address in the database. Then let the students use an abbreviated form of it for sending messages. Post a sign on the work station with this shortened address form. This will help to minimize return mail because of faulty Internet addresses.

6. Before any students are allowed to send E-mail, have them sign an ethics statement agreeing to be polite, responsible, and only post mail that is beneficial to education. Do alert them to the dangers of ever revealing their home phone numbers, addresses or those of anyone else.

7. If you choose a service that does have full Internet access, consider investing in products that will block out any sites that could provide access to any pornographic materials. Products like Surf-Watch or Net Nanny are easily installed and certainly worth the nominal cost.

8. Remember to keep the parents informed of the online activities their children are doing. Getting their written permission for these activities, could be a good idea, besides being good public relations.

9. Call the local newspaper and ask them do a story about what your students are learning through telecommunications. Get as much publicity as possible about the good things schools are doing to help get students ready for the Information Age.

10. Choose a service that has user-friendly communications features. These should include online help with any technical problems, free service updates, and a local or 800 phone number to access the service.

11. Using a large TV which is connected to the work station really helps during the training sessions. Much larger student groups can easily follow the instruction and it also allows the instructor the ability to face that audience.

12. Any aspects of this study could be used to promote cooperative student learning, and the sharing of mutual experiences. The key pal projects encouraged goodwill, friendliness, compassion and empathy for younger students. They learned to become mentors, advisors, and positive role models. All the qualities needed for becoming good citizens.

13. Do consider incorporating and emphasizing some of the Goals 2000 strategies in any telecommunications project. By giving teachers training in the use of online services or electronic databases, they will add to their own education and professional development. By training students to use these databases, they will become better achievers and be better prepared for the workplace. Finally, by keeping parents informed of these educational projects, they also become partners in the social and academic growth of their children.

Dissemination

In July, 1995 this writer was asked to give a presentation on how to teach Internet skills to middle school students. This conference was sponsored by the Association for Educational Communications and Technology (AECT) at Iowa State University in Ames, IA. The title of the presentation was "Ahoy Mates! Book Passage on the Internet." This writer discussed how to start a key pal project, equipment requirements for telecommunications, how to teach students E-mail skills, and how to bring about a

closure to these kinds of activities. The audience received an eight-page booklet which gave Internet addresses for research agencies, bulletin board addresses for linking up key pals, and a comparison of the major online services. She also sent additional information to 14 people who had requested an example of an ethics statement or where to order the equipment to use for the television to computer monitor hook-up.

Being able to exchange teaching strategies with colleagues from many other states and countries was certainly a worthwhile experience for the writer. Another benefit in attending these sessions was learning about what kinds of equipment was prevalent at the university level and what resources were available to them.

This writer will also participate in the writing of 3-volume book series dealing with computer-mediated communication for kindergarten through 12th grades. Every chapter will be written by a different author, each stressing another facet of this type of education. The writer's chapter will explain how to establish articulation programs between primary and middle schools, and between middle schools and high schools by using key pals. All of the writing will be sent online to the editors of this series. Any corrections or revisions also will be done online. This should be a very interesting experience with planned publication date early in 1996. The series will illustrate how many different ways students and teachers can benefit by using computers to teach communication skills within their daily curriculum.

As a final dissemination activity, this writer has offered to host a training session for teachers or administrators from other schools within the district as part of an in-service training. These sessions will review equipment requirements, types of online services available, how to supervise student activities on the Internet, and how to initiate key pal projects.

This practicum represents a project in how to introduce online services and electronic databases to the students and staff of a rural middle school. However, there still is much more work to be done in convincing teachers that the time has come for them to step into the Information Age. Windows 95 finally became available during the last week of this practicum. The day after its introduction, the writer overheard a teacher make this comment in the lounge, " I don't have a clue what Windows 95 is! I'm still using my Apple IIe to do my grades." She definitely is a prime candidate for the next in-service Internet training.

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APPENDIX A

United States
National Commission
on Libraries
and Information Science

NEWS RELEASE

1110 Vermont Avenue, N.W. Suite 820 Washington, D.C. 20005-3522 202-606-9200

For immediate release
21 June 1994

For more information
contact
Peter R. Young

Report on Survey of Public School Library Media Centers Available

Washington, D.C. -- *Public School Library Media Centers in 12 States; Report of the NCLIS/ALA Survey* has been issued by the U.S. National Commission on Libraries and Information Science (NCLIS). The report is the result of a joint effort of the Commission and the American Library Association's Office of Research and Statistics and the American Association of School Librarians.

In her letter transmitting the report to President Clinton, NCLIS Chairperson Jeanne H. Simon summarized some of the findings of the 12-state survey as follows:

- Many school libraries are poorly equipped to support instruction
- ½ of elementary school libraries buy less than one book/student/year
- ½ of secondary school libraries buy less than .33 book/student/year
- Almost no school libraries have access to the Internet computer network
- There is wide variance in average annual funding for school libraries
  - -elementary school libraries receive $15 to $58,874 per year
  - -secondary school libraries receive $155 to $100,810 per year
- In 31% of elementary school libraries the latest world atlas available has a copyright date before 1990
- In 21% of secondary school libraries the latest world atlas available has a copyright date before 1990
- Much work is needed to provide opportunities for school library media specialists to work more closely with classroom teachers.

APPENDIX B

CONDUCT OF ETHICS STATEMENT

I agree to the following guidelines when I am sending and receiving E-mail.

1. I understand that all messages can be read by anyone.
2. All my messages will support the improvement of education.
3. I will not use any abusive, insulting, vulgar, or obscene language.
4. I will only use my school address for E-mail.
5. I will not give anyone's home address to an online inquiry.
6. I will always be courteous, helpful, and patient to other network users.
7. I understand that the systems operator has a right to review all of my mail and to judge the message's appropriateness.
8. I understand that if I violate any of these agreements, my networking privileges will be suspended and I will be disciplined according to the school district's policies.

_____ _____

Name Date

_____

H.R. Teacher

APPENDIX C

TIME MANAGEMENT CHART

PROGRAM USED IN PRODIGY

DATE

KEY PAL ACTIVITIES
ECONOMIC INDICATORS
SQUARE OFF
ENCYCLOPEDIA
MOVIE GUIDE
POLITICAL PROFILE
FITB
KRAZY KAPTIONS
THINKER
BACKGROUND ON THE NEWS
BUSINESS NEWS
HEADLINE NEWS
PEOPLE NEWS
SPORTS NEWS
WEATHER
BEYOND BELIEF
HEALTH NEWS
HEALTH TOPICS
NOVA
FAST NOVAs
SCIENCE NEWS
NATIONAL GEOGRAPHIC
ART GALLERY
BOOK REVIEWS
FOR KIDS BY KIDS
Name

APPENDIX D

TEACHER SURVEY ON E-MAIL USAGE

TO BE GIVEN DURING THE FIFTH MONTH
OF IMPLEMENTATION TO THE 20-25 TEACHERS
WHO PARTICIPATED IN THIS TRAINING

Circle your response

1. How often did you access Prodigy this week?

None Once Two - Five Times More than five times

2. Did you send any E-mail messages?

Yes No

3. Please indicate where you sent this message. _____

4. Did you receive any messages on E-mail?

Yes No

5. Please indicate from where the message came._____

COMMENTS: _____

_____

_____

APPENDIX E

STUDENT USAGE OF PRODIGY SURVEY

TO BE GIVEN TO APPROXIMATELY 100 STUDENTS
DURING THE EIGHTH MONTH OF TRAINING

1. Please circle the areas on the Prodigy service you used the most.

Language & Art **Math & Finance** **Social Studies** **News & More**

Reference **Science & Health** **Communications** **Fun & Games**

2. How did you use the information you found on Prodigy? Please circle as many answers that apply.

Class Assignments **Extra Credit Assignments** **Fun** **Homework**

Research **To meet keypals** **Just for my own curiosity**

3. Any comments? _____

_____

_____

Name_____ Grade_____

H.R._____

APPENDIX F

TEACHER INTERNET SURVEY

Circle your response

1. Can you now access Prodigy without any help?

Yes No

2. Can you now E-mail messages back and forth without help?

Yes No

3. How many services on Prodigy did you use?

One Two - Five More than five

4. Please rate the Prodigy in-service training.

Excellent Very Good OK Poor

5. Please answer the following questions.

I liked these Prodigy services the

best_____

_____

I liked these Prodigy services the

least_____

_____

APPENDIX G

YOUR

GLOSSARY AND GUIDE

TO THE INTERNET

AND E-MAIL

TELECOMMUNICATIONS TERMS TO LEARN

Archie - A system for locating files, cost-free, from a File Transfer Protocol (FTP).

baud - Speed at which data can be transmitted per second; 9600 baud sends a signal 9600 times over the phone line. Baud rate and modem go together.

BBS - Bulletin Board System. Takes in and sends out electronic messages. Password needed to access a BBS.

Compressed Video - Normal video signals that have been "downsized" for transmission.

Dial-Up - Access a service by using a modem to connect your computer to another.

E-mail - Electronic mail "sent" quickly by your computer to a keypal. It's the opposite of snail mail (a regular letter).

FAQ - Frequently Asked Questions or a list of them. Sometimes found in a "Help Menu." These questions and answers often are posted by USENET groups to save time.

Flame - A nasty comment by someone to a writer on a USENET. You will **not** engage in this type of activity

Freenet - A free service provided mostly by public libraries to their patrons, to access the Internet.

FTP - File Transfer Protocol, a way to transfer files from one computer to another.

Gopher - A tunnel that gets you quickly from one place to another on the Internet.

Internet - A group of distant networks, linked together, that also work together for each other's benefit.

IP - Internet Procol, allow data to travel through many networks to reach its final home.

LAN - Local Area Network, a system of computers connected together by a fileserver.

Last Mile - describes the final part of a transmission path to its intended destination.

Modem - Equipment which connects a computer to a phone line. The faster, the better.

Mosaic - An "up-front" menu or control panel that helps you navigate the Net by using your electronic mouse or trac ball.

NIC - Network Information Center, gives information about a network.

NREN - National Research and Education Network, a U.S. government agency which combines other federal agency networks into one high-speed network.

Packet - Bundle of data. The Internet divides data into little pieces (packets). Then each "packet" travels the Net all by itself.

Router - A system which transfers data between two networks using the same protocols

Satellite - A communications relay instrument which orbits the earth.

Server - A computer used in a LAN, gives storage space to the network and user info.

Service Provider - Gives you or your company access to parts of the Internet.

TELNET - A program that lets you log in to other computer systems on the Net. Must use the TELNET protocol.

UNIX - One of the original operating systems that allowed access to the Net, very important to the Net's development.

Veronica - Allows you to search the Net, easily, for any of its stored information.

WAIS - Wide-area information servers, great way to look up information from databases or libraries on the Net.

WAN - Wide-area network, connects a local network (LAN), to a distant network.

Workstation - a PC connected to a LAN and used by one person.

World-Wide Web or WWW - A hypertext-based system to find and access resources on the Net.

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APPENDIX H

POWER ON !

DIAL UP....

HOOK IN....

TO

THE INTERNET !!

APPENDIX I

NAME_____ GRADE_____ 83

THE BIG NET HUNT

****

1. JUMP TO WEATHER. WHAT'S THE TEMPERATURE IN ROME TODAY? _____

2. JUMP TO MOBIL TRAVEL GUIDE. NAME AN AMES, IA. RESTAURANT AND THE COST_____

3. JUMP TO CONSUMER REPORTS. WHAT ELECTRIC DRYER WAS RATED TOPS? _____

4. JUMP TO MOVIE GUIDE. WHO DIRECTED BATMAN IN 1989? _____

5. JUMP TO NOVA/PAST ADVENTURES. WHAT WAS WRONG WITH THE ARC LAMP? _____

6. JUMP TO COMM CENTER. POST A NOTE ON THE MIDDLE SCHOOL BB AND SHOW IT TO MRS. CHRISTY.

7. JUMP TO PEOPLE NEWS. LIST THE BIRTHDAYS OF TODAY'S CELEBS._____

8. JUMP TO BABYSITTER'S CLUB/TIPS. WHAT SHOULD YOU NEVER DO WHEN USING 911? _____

9. JUMP TO ART GALLERY. WHO DID *GARGOYLES*? _____DOWNLOAD IT AND SHOW TO MRS. CHRISTY.

10. JUMP TO QUOTE CHECK. WHAT'S THE SYMBOL FOR MCDONALD'S CORPORATION? _____

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EXTRA CREDIT

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JUMP TO PUNCH LINE. WHAT'S THE HACKER'S BUMPER STICKER? _____